

**CLAIMS**

What is claimed is:

1. An isolated polypeptide comprising a sequence selected from one of:
  - (a) SEQ ID NOS:1-23;
  - (b) SEQ ID NOS:26-31;
  - (c) SEQ ID NOS:1-23 having one or more conservative amino acid substitutions; or
  - (d) SEQ ID NOS:26-31 having one or more conservative amino acid substitutions.
2. The isolated polypeptide of claim 1 wherein the sequence is selected from one of (A) or (B).
3. The isolated polypeptide of claim 1 wherein the sequence is selected from SEQ ID NO:1 or SEQ ID NO:9.
4. The isolated polypeptide of claim 1 wherein the sequence is selected from SEQ ID NO:2 or SEQ ID NO:10.
5. The isolated polypeptide of claim 1 wherein the sequence is selected from SEQ ID NO:3 or SEQ ID NO:7.
6. The isolated polypeptide of claim 1 wherein the sequence is selected from SEQ ID NO:8.
7. The isolated polypeptide of claim 1 wherein the sequence is selected from SEQ ID NO:4 or SEQ ID NO:13.

1                   8.     The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:5 or SEQ ID NO:17.

1                   9.     The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:6 or SEQ ID NO:18.

1                   10.    The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:12 or SEQ ID NO:21.

1                   11.    The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:11 or SEQ ID NO:15.

1                   12.    The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:14 or SEQ ID NO:16.

1                   13.    The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:19 or SEQ ID NO:20.

1                   14.    The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:22 or SEQ ID NO:23.

1                   15.    The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:26 or SEQ ID NO:27.

1                   16.    The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:28 or SEQ ID NO:29.

1                   17.    The isolated polypeptide of claim 1 wherein the sequence is selected from  
2     SEQ ID NO:30 or SEQ ID NO:31.

1                   18.    The isolated polypeptide of claim 2 wherein the polypeptide comprises  
2     part of a carrier protein.

1                   19.    The isolated polypeptide of claim 2 further comprising an accessory  
2     molecule.

1                   20.     The isolated polypeptide of claim 19 wherein the accessory molecule is a  
2 tag molecule, identification molecule, chemotherapeutic agent, radiopharmaceutical, cytotoxic  
3 agent, treatment molecule, antigenic molecule, antibody fragment or antibody.

1                   21.     The isolated polypeptide of claim 1 wherein the polypeptide consists  
2 essentially of a sequence selected from (A), (B), (C) or (D).

1                   22.     A method for binding a peptide to a cell, comprising:  
2 contacting a polypeptide comprising a sequence selected from one of:

3                   (a)     SEQ ID NOS:1-23;  
4                   (b)     SEQ ID NOS:26-31;  
5                   (d)     SEQ ID NOS:1-23 having one or more conservative amino acid  
6 substitutions; or

7                   (d)     SEQ ID NOS:26-31 having one or more conservative amino acid  
8 substitutions,

9                   with one or more cells for a period of time sufficient to produce one or more  
10 polypeptide-bound cells.

11                   23.     The method of claim 22 wherein the polypeptide comprises a sequence  
12 selected from (a) or (b).

1                   24.     The method of claim 22 further comprising separating any polypeptide-  
2 bound cells.

1                   25.     The method of claim 22 wherein the one or more cells are leukemia cells.

1                   26.     The method of claim 23 wherein the polypeptide is attached to a solid  
2 support or a viral envelope.

1                   27     The method of claim 23 further comprising measuring the number of  
2 polypeptide-bound cells.

1                   28.     The method of claim 22 wherein the polypeptide comprises part of a  
2 carrier protein.

1                   29.     The method of claim 22 wherein the polypeptide comprises an accessory  
2 molecule.

1                   30.     The method of claim 22 wherein the accessory molecule is a tag molecule,  
2 detection molecule, chemotherapeutic agent, radiopharmaceutical, cytotoxic agent, treatment  
3 molecule, antigenic molecule, antibody fragment or antibody.

1                   31.     The method of claim 22 wherein the polypeptide consists essentially of a  
2 sequence selected from one of (a), (b), (c) or (d).

1                   32.     A kit for binding polypeptides to cells comprising instructions for carrying  
2 out the method of claim 22.

1                   33.     The kit of claim 32 further comprising one or more polypeptides  
2 comprising a sequence selected from one of:

3                   (a)     SEQ ID NOS:1-23;

4                   (b)     SEQ ID NOS:26-31;

5                   (c)     SEQ ID NOS:1-23 having one or more conservative amino acid  
6 substitutions; or

7                   (d)     SEQ ID NOS:26-31 having one or more conservative amino acid  
8 substitutions.

1                   34.     A method of inducing an acute myelogenous leukemia cell differentiation  
2 into a mature hematopoietic cell comprising:

3                   (a)     contacting an acute myelogenous leukemia cell with a peptide that  
4 preferentially binds to the acute myelogenous leukemia cell to produce a peptide-bound acute  
5 myelogenous leukemia cell; and

6                   (b)     inducing differentiation of the peptide-bound acute myelogenous leukemia  
7 cell into a mature blood cell that performs normal blood cell function.

1                   35.     The method of claim 34 wherein the peptide induces differentiation of the  
2 peptide-bound acute myelogenous leukemia cell into the mature blood cell.

1                   36.     The method of claim 34 wherein the peptide is bound to a treatment  
2 molecule which induces differentiation of the peptide-bound acute myelogenous leukemia cell  
3 into the mature blood cell.

1                   37.     The method of claim 34 wherein steps (a) and (b) are performed *in vivo*.

1                   38.     The method of claim 37 further comprising contacting one or more  
2 additional acute myelogenous leukemia cells with a chemotherapeutic agent.

1                   39.     An isolated peptide comprising a binding region which binds  
2 preferentially to a surface of a blood cell with the proviso that the peptide does not bind to an  
3 immunogenic molecule on the surface of the blood cell.

1                   40.     The isolated peptide of claim 39 wherein the blood cell is a leukemia cell.

1                   41.     The isolated polypeptide of claim 39 wherein the polypeptide comprises  
2 part of a carrier protein.

1                   42.     The isolated polypeptide of claim 39 further comprising an accessory  
2 molecule.

1                   43.     The isolated polypeptide of claim 39 wherein the accessory molecule is a  
2 tag molecule, identification molecule, chemotherapeutic agent, radiopharmaceutical, cytotoxic  
3 agent, treatment molecule, antigenic molecule, antibody fragment or antibody.

1                   44.     The isolated polypeptide of claim 40 wherein the polypeptide induces  
2 differentiation of the leukemia cell into a mature blood cell capable of normal blood cell  
3 function.

1                   45.     The isolated polypeptide of claim 40 wherein the polypeptide inhibits  
2 proliferation of the leukemia cell.

1           46.     A method for specifically binding a peptide with a cellular component  
2 comprising contacting a portion of a cell membrane of a hematopoietic cell with a peptide that  
3 preferentially binds to a component of the cell membrane of the hematopoietic cell for a  
4 sufficient period of time to allow the peptide to bind to the component of the cell membrane,  
5 wherein the component of the cell membrane that is preferentially bound by the peptide is  
6 weakly immunogenic or not immunogenic.

1           47.     The method of claim 46 further comprising separating the portion of the  
2 hematopoietic cell membrane bound to the peptide.

1           48.     The method of claim 46 wherein the peptide is bound to an accessory  
2 molecule or a solid support.

1           49.     The method of claim 48 wherein the accessory molecule is a tag molecule,  
2 identification molecule, chemotherapeutic agent, radiopharmaceutical, cytotoxic agent, treatment  
3 molecule, antigenic molecule, antibody fragment or antibody.

1           50.     The method of claim 47 wherein the hematopoietic cell is a leukemia or a  
2 preleukemia cell.

1           51.     The method of claim 47 further comprising identifying the portion of the  
2 hematopoietic cell membrane bound to the peptide.